Listing of Claims:

1. (Original) An apparatus for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

a tubular body adapted for connection within a drill string disposed in the wellbore, the body being equipped with one or more protuberances along an axial portion thereof defining an expanded axial portion;

a probe carried by the body at or near a first location within the expanded axial portion of the body where the cross-sectional area of the expanded axial portion is a minimum, the probe being movable between retracted and extended positions; and

an actuator carried by the body for moving the probe between its retracted and extended positions, the extended position being for engaging the wall of the wellbore and acquiring information from the formation, and the retracted position being for protecting the probe while drilling.

2. (Original) The apparatus of claim 1, wherein the tubular body is a drill collar.

3. (Original) The apparatus of claim 1, wherein the tubular body is a stabilizer equipped with a plurality of ribs for stabilizing the drill string.

4. (Original) The apparatus of claim 1, wherein the tubular body is a centralizer equipped with a plurality of ribs for centralizing the drill string.

5. (Original) The apparatus of claim 1, wherein the body is equipped with

a first rib that spans substantially the length of the expanded axial portion, and

second and third ribs each having a length less than half the length of the first rib and disposed on opposing sides of the midpoint of the expanded axial portion, and

the first location lies at the midpoint of the expanded axial portion.

6. (Original) The apparatus of claim 5, wherein the body is further equipped with a fourth rib that spans substantially the length of the expanded axial portion radially opposite the first rib.

7. (Original) The apparatus of claim 5, wherein the first rib is helicoidal near its ends and axially linear intermediate its ends.

8. (Original) The apparatus of claim 5, wherein the ribs are one of helicoidal, oblique, and axially linear.

9. (Original) The apparatus of claim 5, wherein one or more of the ribs has a thickness that varies over its length.

10. (Original) The apparatus of claim 1, wherein the probe includes a conduit disposed within an annular seal.

11. (Original) The apparatus of claim 1, wherein the actuator employs hydraulic fluid to move the probe.

12. (Original) The apparatus of claim 1, wherein the actuator employs electrical power to move the probe.

13. (Original) The apparatus of claim 10, further comprising a sensor in fluid communication with the conduit for measuring a property of the formation.

14. (Original) The apparatus of claim 13, wherein the sensor is a pressure sensor for measuring the pore pressure of the formation.

15. (Original) The apparatus of claim 1, wherein:

the first location lies on a protuberance within the expanded axial portion; and

the probe is at least partially carried within a channel formed in the protuberance at or near the first location, the protuberance extending radially beyond the retracted probe such that the probe is recessed within the protuberance when the probe is retracted, the channel having a width sized for closely bounding a portion of the probe and the channel extending azimuthally from the probe through one side of the protuberance, whereby wellbore debris is free to flow along the channel away from the probe during drilling.

16. (Original) The apparatus of claim 15, wherein the channel extends azimuthally in a clockwise direction from the probe.

17. (Original) The apparatus of claim 1, further comprising:

a cover releasably-secured about the probe for protecting the probe while drilling prior to the probe being first moved to its extended position; and wherein

the movement of the probe by the actuator to the probe's extended position releases the cover from the probe and positions the probe in engagement with the wall of the wellbore for acquiring information from the formation.

18. (Original) The apparatus of claim 1, further comprising

a backup support carried by the body azimuthally opposite the probe and movable between retracted and extended positions, the backup support being designed to shear at a preselected location upon encountering a predetermined shear load; and

a backup support actuator carried by the body for moving the backup support between its retracted and extended positions, the extended position being for assisting the engagement of the probe with the wall of the wellbore, and the retracted position being for protecting the backup support while drilling.

19. (Original) The apparatus of claim 1, wherein the probe is substantially cylindrical and is carried for movement within a bore in the protuberance.

20. (Original) The apparatus of claim 15, wherein the probe is substantially cylindrical and is carried for movement within a bore in the protuberance, the bore penetrating the channel.

21. (Original) An apparatus for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

a tubular body adapted for connection within a drill string disposed in the wellbore;

a probe at least partially carried within a channel formed in a protruding portion of the body for movement of the probe between retracted and extended positions, the protruding portion extending radially beyond the probe such that the probe is recessed within the protuberance when the probe is retracted, the channel having a width sized for closely bounding a portion of the probe, the channel extending azimuthally from the probe

through one side of the protuberance, whereby wellbore debris is free to flow along the channel away from the probe during drilling; and

an actuator carried by the body for moving the probe between its retracted and extended positions, the extended position disposing the probe radially beyond the protruded portion of the body for engaging the wall of the wellbore and acquiring information from the formation, and the retracted position being for protecting the probe while drilling.

22. (Original) The apparatus of claim 21, wherein the channel extends azimuthally in a clockwise direction from the probe.

23. (Original) The apparatus of claim 21, wherein the tubular body is a drill collar.

24. (Original) The apparatus of claim 21, wherein the tubular body is a stabilizer equipped with a plurality of ribs for stabilizing the drill string.

25. (Original) The apparatus of claim 21, wherein the tubular body is a centralizer equipped with a plurality of ribs for centralizing the drill string.

26. (Original) The apparatus of claim 21, wherein the probe includes a conduit disposed within an annular seal.

27. (Original) The apparatus of claim 21, wherein the actuator employs hydraulically fluid to move the probe.

28. (Original) The apparatus of claim 21, wherein the actuator employs electrical power to move the probe.

29. (Original) The apparatus of claim 26, further comprising a sensor in fluid communication with the conduit for measuring a property of the formation.

30. (Original) The apparatus of claim 29, wherein the sensor is a pressure sensor for measuring the pore pressure of the formation.

31. (Original) The apparatus of claim 21, wherein:

the tubular body is equipped with one or more protuberances along an axial portion thereof defining an expanded axial portion; and

the probe is carried by the body at or near a first location within the expanded axial portion of the body where the cross-sectional area of the expanded axial portion is a minimum for movement of the probe between retracted and extended positions.

32. (Original) The apparatus of claim 31, wherein the body is equipped with

a first rib that spans substantially the length of the expanded axial portion, and

second and third ribs each having a length less than half the length of the first rib and disposed on opposing sides of the midpoint of the expanded axial portion, and

the first location lies at the midpoint of the expanded axial portion.

33. (Original) The apparatus of claim 32, wherein the body is further equipped with a fourth rib that spans substantially the length of the expanded axial portion radially opposite the first rib.

34. (Original) The apparatus of claim 32, wherein the first rib is helicoidal near its ends and axially linear intermediate its ends.

35. (Original) The apparatus of claim 32, wherein the ribs are one of helicoidal, oblique, and axially linear.

36. (Original) The apparatus of claim 32, wherein one or more of the ribs has a thickness that varies over its length.

37. (Original) The apparatus of claim 21, further comprising:

a cover releasably-secured about the probe for protecting the probe while drilling prior to the probe being first moved to its extended position; and wherein

the movement of the probe by the actuator to the probe's extended position releases the cover from the probe and positioning the probe in engagement with the wall of the wellbore for acquiring information from the formation.

38. (Original) The apparatus of claim 21, further comprising

a backup support carried by the body radially opposite the probe and movable between retracted and extended positions, the backup support being designed to shear at a preselected location upon encountering a predetermined shear load; and

a backup support actuator carried by the body for moving the backup support between its retracted and extended positions, the extended position being for assisting the engagement of the probe with the wall of the wellbore, and the retracted position being for protecting the backup support while drilling.

39. (Original) An apparatus for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

a tubular body adapted for connection within a drill string disposed in the wellbore;

a probe carried by the body for movement of the probe between retracted and extended positions;

a cover releasably-secured about the probe for protecting the probe while drilling prior to the probe being first moved to its extended position; and

an actuator carried by the body for moving the probe between its retracted and extended positions, the movement of the probe to its extended position releasing the cover from the probe and positioning the probe in engagement with the wall of the wellbore for acquiring information from the formation, the movement of the probe to its retracted position being for protecting the probe while drilling.

40. (Original) The apparatus of claim 39, wherein:

the probe is substantially cylindrical and carried for movement within a bore in a protuberance formed along a portion of the body; and

the cover has a continuous cylindrical side wall sized to closely fit in an annulus formed between the probe and the wall of the bore in the protuberance when the probe is retracted.

41. (Original) The apparatus of claim 40, wherein:

a first annular groove is formed in the wall of the bore in the protuberance; and

a second annular groove is formed in the side wall of the cover;

the first and second grooves aligning to forma toroidal space when the cover is secured about the probe; and

a shearable ring disposed in the toroidal space for releasably securing the cover to the bore of the protuberance.

42. (Original) The apparatus of claim 40, wherein:

an annular groove is formed in the wall of the bore in the protuberance; and

the side wall of the cover is equipped with a shearable annular flange at an end thereof adapted to fit the annular groove.

43. (Original) The apparatus of claim 39, wherein the tubular body is a drill collar.

44. (Original) The apparatus of claim 39, wherein the tubular body is a stabilizer equipped with a plurality of ribs for stabilizing the drill string.

45. (Original) The apparatus of claim 39, wherein the tubular body is a centralizer equipped with a plurality of ribs for centralizing the drill string.

46. (Original) The apparatus of claim 39, wherein the probe includes a conduit disposed within an annular seal.

47. (Original) The apparatus of claim 39, wherein the actuator employs hydraulically fluid to move the probe.

48. (Original) The apparatus of claim 39, wherein the actuator employs electrical power to move the probe.

49. (Original) The apparatus of claim 46, further comprising a sensor in fluid communication with the conduit for measuring a property of the formation.

50. (Original) The apparatus of claim 49, wherein the sensor is a pressure sensor for measuring the pore pressure of the formation.

51. (Original) The apparatus of claim 39, wherein

the tubular body is equipped with one or more protuberances along an axial portion thereof defining an expanded axial portion; and

the probe is carried by the body at or near a first location within the expanded axial portion of the body where the cross-sectional area of the expanded axial portion is a minimum for movement of the probe between retracted and extended positions.

52. (Original) The apparatus of claim 51, wherein the body is equipped with

a first rib that spans substantially the length of the expanded axial portion, and

second and third ribs each having a length less than half the length of the first rib and disposed on opposing sides of the midpoint of the expanded axial portion, and

the first location lies at the midpoint of the expanded axial portion.

53. (Original) The apparatus of claim 52, wherein the body is further equipped with a fourth rib that spans substantially the length of the expanded axial portion radially opposite the first rib.

54. (Original) The apparatus of claim 52, wherein the first rib is helicoidal near its ends and axially linear intermediate its ends.

55. (Original) The apparatus of claim 52, wherein the ribs are one of helicoidal, oblique, and axially linear.

56. (Original) The apparatus of claim 52, wherein one or more of the ribs has a thickness that varies over its length.

57. (Original) The apparatus of claim 39, further comprising

a backup support carried by the body radially opposite the probe and movable between retracted and extended positions, the backup support being designed to shear at a preselected location upon encountering a predetermined shear load; and

a backup support actuator carried by the body for moving the backup support between its retracted and extended positions, the extended position being for assisting the engagement of the probe with the wall of the wellbore, and the retracted position being for protecting the backup support while drilling.

58. (Original) An apparatus for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

a tubular body adapted for connection within a drill string or along a wireline disposed in the wellbore;

a probe carried by the body for movement of the probe between retracted and extended positions;

a backup support carried by the body radially opposite the probe and movable between retracted and extended positions, the backup support being designed to shear at a preselected location upon encountering a predetermined shear load;

a probe actuator carried by the body for moving the probe between its retracted and extended positions, the extended position being for engaging the wall of the wellbore and acquiring information from the formation, and the retracted position being for protecting the probe while drilling; and

a backup support actuator carried by the body for moving the backup support between its retracted and extended positions, the extended position being for assisting the engagement of the probe with the wall of the wellbore, and the retracted position being for protecting the backup support while drilling.

59. (Original) The apparatus of claim 58, wherein the backup support includes

a piston body carried within a bore in the tubular body for movement between extended and retracted positions, and

a piston head carried at least partially within a bore in the piston body for movement between extended and retracted positions, the piston head being designed to shear upon encountering the predetermined shear load.

60. (Original) The apparatus of claim 59, wherein the piston head includes a material having a relatively low shear strength.

61. (Original) The apparatus of claim 60, wherein the material is an aluminum alloy.

62. (Original) The apparatus of claim 60, wherein the material is an oriented strand composite.

63. (Original) The apparatus of claim 59, wherein the piston head is designed to shear by erosion.

64. (Original) The apparatus of claim 59, wherein the piston head is designed to shear by shear failure.

65. (Original) The apparatus of claim 59, wherein the piston head includes a central base formed of metal and an outer composite jacket secured about the central base.

66. (Original) The apparatus of claim 65, wherein the central base has grooves formed therein for engagement by the composite jacket.

67. (Original) The apparatus of claim 66, wherein the grooves serve as preferential shear failure sites.

68. (Original) The apparatus of claim 65, wherein the composite jacket has an enlarged outer diameter at a distal end, forming a mushroom-shaped head having a shoulder.

69. (Original) The apparatus of claim 68, wherein the shoulder has radial grooves formed therein providing channels for debris to flow clear of the shoulder, thereby reducing the likelihood of debris becoming trapped between the head and the tubular body when the piston head is moved to its retracted position.

70. (Original) The apparatus of claim 58, wherein the tubular body is a drill collar.

71. (Original) The apparatus of claim 58, wherein the tubular body is a stabilizer equipped with a plurality of ribs for stabilizing the drill string.

72. (Original) The apparatus of claim 58, wherein the tubular body is a centralizer equipped with a plurality of ribs for centralizing the drill string.

73. (Original) The apparatus of claim 58, wherein the probe includes a conduit disposed within an annular seal.

74. (Original) The apparatus of claim 58, wherein the actuator employs hydraulically fluid to move the probe.

75. (Original) The apparatus of claim 58, wherein the actuator employs electrical power to move the probe.

76. (Original) The apparatus of claim 73, further comprising a sensor in fluid communication with the conduit for measuring a property of the formation.

77. (Original) The apparatus of claim 76, wherein the sensor is a pressure sensor for measuring the pore pressure of the formation.

78. (Original) The apparatus of claim 58, wherein

the tubular body is equipped with one or more protuberances along an axial portion thereof defining an expanded axial portion; and

the probe is carried by the body at or near a first location within the expanded axial portion of the body where the cross-sectional area of the expanded axial portion is a minimum for movement of the probe between retracted and extended positions.

79. (Original) The apparatus of claim 78, wherein the body is equipped with

a first rib that spans substantially the length of the expanded axial portion, and

second and third ribs each having a length less than half the length of the first rib and disposed on opposing sides of the midpoint of the expanded axial portion, and

the first location lies at the midpoint of the expanded axial portion.

80. (Original) The apparatus of claim 79, wherein the body is further equipped with a fourth rib that spans substantially the length of the expanded axial portion radially opposite the first rib.

81. (Original) The apparatus of claim 79, wherein the first rib is helicoidal near its ends and axially linear intermediate its ends.

82. (Original) The apparatus of claim 79, wherein the ribs are one of helicoidal, oblique, and axially linear.

83. (Original) The apparatus of claim 79, wherein one or more of the ribs has a thickness that varies over its length.

84. (Original) A method of acquiring information from a subsurface formation penetrated by a wellbore, comprising the steps of:

equipping a tubular body with

one or more protuberances along an axial portion thereof defining an expanded axial portion, and

a movable probe at or near a first location on the tubular body within the expanded axial portion where the cross-sectional area of the expanded axial portion is a minimum;

connecting the tubular body within a drill string;

disposing the drill string within the wellbore; and

selectively extending the probe such that the probe engages the wall of the wellbore for acquiring information from the formation, and retracting the probe to protect the probe while drilling.

85. (Original) A method for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

equipping a tubular body with

a protruding portion having a channel formed therein, the channel extending transversely through at least one side of the protruding portion, and

a movable probe carried at least partially within the channel;

connecting the tubular body within a drill string;

disposing the drill string within the wellbore; and

selectively extending the probe such that the probe engages the wall of the wellbore for acquiring information from the formation, and retracting the probe to a recessed position within the protruded portion whereby wellbore debris is free to flow along the channel away from the probe during drilling.

86. (Original) A method of acquiring information from a subsurface formation penetrated by a wellbore, comprising:

equipping a tubular body with a movable probe having a releasable cover, the cover being released by extension of the probe from a retracted position;

connecting the tubular body within a drill string;

disposing the drill string within the wellbore; and

selectively extending the probe from the retracted position to release the cover and move the probe into engagement with the wall of the wellbore for acquiring information from the formation, and retracting the probe to the retracted position to protect the probe while drilling.

87. (Original) An apparatus for acquiring information from a subsurface formation penetrated by a wellbore, comprising:

equipping a tubular body with

a movable probe, and

a movable backup support positioned radially opposite the probe, the backup support being designed to shear at a preselected location upon encountering a predetermined shear load;

connecting the tubular body within a drill string;

disposing the drill string within the wellbore;

selectively extending the probe into engagement with the wall of the wellbore for acquiring information from the formation, and retracting the probe to protect the probe while drilling; and

selectively extending the backup support into engagement with the wall of the wellbore radially opposite the probe to supplement the engagement by the probe with the wellbore wall, retracting the backup support as required while drilling, and upon failure to retract the

backup support applying a shear load at least as great as the predetermined shear load to the backup support to shear the backup support at the preselected location.